

A conversation with Nancy Martin, January 21, 2019

Participants

- Nancy Martin – CEO & Founder, Fortify
- Andrew Martin – Research Analyst, GiveWell

Note: These notes were compiled by GiveWell and give an overview of the major points made by Ms. Nancy Martin.

Summary

GiveWell spoke with Ms. Martin of Fortify to gain a better understanding of Fortify's work. Conversation topics included Fortify's relationship with the private sector, the advantages of tomato-based products as delivery vehicles for iron, and Fortify's plans for the near future.

Overview of Fortify

Fortify is a non-governmental organization (NGO) which was established in 2012 with the goal of addressing iron deficiency anemia (IDA) in the developing world, especially among mothers. IDA during pregnancy puts mothers at an increased risk of death during childbirth.

Fortify's goal is to activate the private sector to take on voluntary micronutrient fortification work, then step back and let the marketplace take over. Fortify hopes that once it demonstrates that companies can be a major player in iron fortification, it will be easier for developing countries to make progress on fortification, and for those countries' governments to invest in and monitor fortification.

Focus on tomato-based products

When Ms. Martin began Fortify, she set out to iron-fortify a product that is already widely consumed. Early on, as a result of research that Ms. Martin conducted with a team at the University of Chicago Booth School of Business, Fortify decided to focus on fortifying tomato-based products in Africa. This was primarily because tomato sauce and tomato paste are an integral part of most recipes at all income levels throughout sub-Saharan Africa, and these products are processed and widely distributed rather than produced locally, which is the case with maize flour. This means that fortifying tomato paste could improve blood iron levels without any change in consumer behavior.

Relationship with private sector

Fortify is different from other food fortification NGOs in that it advocates for the private sector to take on fortification work, rather than working with governments, and it focuses on getting iron into the diets of women. Its plan is to discover the optimal iron formulation for tomato-based products, then walk companies through the process of incorporating it into their products properly. After that, the

company's fortification process would be monitored by a country's food and drug administration (FDA).

Market incentives

When fortification is mandated by the government, companies do not have much stake in the process, and the mandated products are staples like wheat flour and salt. On the other hand, when companies take the initiative on new products, they will have an incentive to market their product differentiation.

Fortify also has confidence in companies following through with fortifying their products because of the upfront investment needed for fortification. Once a company decides to move forward with fortifying a product, it will invest in a production line for a fortified product and may build a marketing campaign around the product's health benefits. Both of these costs make it less likely that a company would fail to follow through.

Monitoring

When a company receives a government's FDA approval for any new product, then it would be the responsibility of the country's FDA to monitor compliance with any claims on the label of the product.

Partnership with Olam International

Olam International is a major global agribusiness company, which happens to have a small packaged food business in West Africa that is one of the leading brands of tomato paste. Ms. Martin approached the CEO of Olam with the idea of fortifying the tomato paste with iron and he was very enthusiastic, and Olam has moved forward with this work.

Research

Though Fortify was not able to conduct the necessary research itself, Olam was committed enough to iron fortification that it hired a research lab to figure out how to add the recommended daily allowance of iron to its own tomato mix.

Distribution

Olam's tomato mix has successfully completed stability testing, and is currently waiting for FDA approval in Ghana. Once Olam gets through the approval process in Ghana, they hope to work towards distribution in other parts of West Africa as well.

Potential for work in India

Once Fortify has established itself in Africa, it is interested in exploring the potential market in India, because common dishes in many parts of India use tomato-based products. With sufficient funding, Fortify could run programs concurrently in both India and sub-Saharan Africa.

Iron fortification

Benefits of iron fortification

Mortality

One of Fortify's goals is to save women from dying during childbirth. Hemorrhage is the leading cause of childbirth-related death throughout the developing world, and women who have IDA cannot recover from hemorrhage because they have no iron stores with which to replenish their own blood (and blood transfusions are largely unavailable). By reducing IDA, iron fortification should reduce the number of deaths from post-partum hemorrhage.

Income

According to the World Health Organization (WHO), IDA can decrease national productivity by ~20% because it reduces people's capacity to participate in the economy. This means that iron fortification should increase productivity, thereby increasing income.

Interaction with malaria

There is some concern about supporting iron fortification and supplementation initiatives because iron deficiency can protect individuals against severe cases of malaria. However, at the lower doses found in iron-fortified foods, this is unlikely to present a problem. Fortify expects that fortifying tomato paste with low doses of iron will not have any impact on malaria issues in children.

Supplementation

Academic studies have found that iron supplementation has in general not been very successful at decreasing maternal mortality rates or IDA in the developing world. This is largely because women do not take the pills consistently. Iron pills can cause severe gastrointestinal distress, and the women who receive these pills are already lacking in strength and energy because of IDA, so they are likely to stop taking the pill after it makes them sick the first time.

Because of this low compliance, distribution figures for iron tablets are not very useful for determining coverage. Compliance might be improved if iron supplements were given by a healthcare professional who also explained why the pill is necessary and warned of the side effects, but in many of the relevant countries pregnant women do not have access to healthcare professionals.

Wheat flour vs tomato-based products

There is general agreement among people who work on micronutrient fortification that fortified flour alone will not be able to fully address IDA, and that it is important to bring multiple sources of iron into the diet. Wheat flour is also not an ideal vehicle for iron due to its limited geographic distribution and its effect on iron's bioavailability. Fortify believes that tomato-based products will make iron more

bioavailable to consumers, and will be recognized as a welcomed complement to existing fortified foods.

Disadvantages of wheat flour fortification

Although iron-fortified wheat flour has had some positive impact, it has fallen short of expectations for addressing IDA in people in rural areas, who generally live on the least amount of money and have the highest rates of iron deficiency.

Reach

In sub-Saharan Africa, rural populations do not frequently consume fortified wheat flour because it is milled in industrial mills, which are located in urban centers. Since flour is heavy, it is expensive to distribute, so it doesn't often reach more remote areas.

Ms. Martin believes that flour fortification faces a similar problem in India, except that the flour distribution issue is even more complicated there. Ms. Martin also does not believe that flour is as widely consumed in India as it needs to be in order for flour fortification to have an impact on IDA.

Bioavailability

Grain products contain a compound called phytate, which reduces the bioavailability of iron in other foods when consumed together. This reduces the effectiveness of iron-fortified grain products, although consuming fortified flour does still have positive effects on blood iron levels for those who have access to it.

Reasons flour is so widely fortified

Many organizations and governments are attached to flour fortification because it is simple and convenient. In most countries in sub-Saharan Africa, most flour processing happens at an institutional level, so there are relatively few flour mills and thus the market is relatively easy to control. The fortification process is also well-known, meaning that it is easy and low-risk to adopt it.

Advantages of fortifying tomato-based products with iron

Reach

Tomato paste is far more widely consumed by Fortify's target population, including in rural areas, than almost any other product that could potentially be fortified.

Bioavailability

Tomato paste is an ideal delivery vehicle for iron because ascorbic acid (which is present in tomatoes) increases bioavailability and absorption of iron.

Business plan

Work with Nigerian tomato sauce company

Fortify has decided to move forward in developing a business plan based on interest from a Nigerian company that produces tomato sauce. The company is young and has a relatively small market share in middle-class urban areas, which is not the target market for Fortify. However, the company is enthusiastic about building a business that benefits customers, and would like to dedicate a production line to creating an iron-fortified product for institutional buyers.

Creating institutional products

Fortify's current plan is to develop a business plan for any company that wants to create an iron-fortified tomato product that could be sold to organizations that distribute food products on a humanitarian basis, such as:

- The United Nations World Food Programme (WFP)
- Save the Children
- Governments that provide school lunches

These organizations will not provide financial support for the development of iron-fortified tomato paste, but might be interested in distributing the product once it has been created and shown to be appropriate for their food distribution programs.

Research plan

Developing an iron-fortified tomato-based product

Fortify is currently seeking funding to conduct a study on the optimal way to add iron to tomato-based products. It plans to work with a university on this study. Fortify has already talked to a few universities that may be interested in doing this kind of research.

The results of the study would be published in a peer-reviewed journal, so that they would be freely available for any food product manufacturer interested in adding iron to tomato-based products. This would make it much easier for companies to take on the process of fortifying tomato-based products with iron because they would have a proven iron formulation, and so would not have to do their own research before beginning fortification.

Process

Fortify expects the steps in the process to be:

- Acquire tomato sauce from the manufacturing partner.
- Look at the components of the tomato sauce in the lab.
- Develop a suitable iron formulation.
- Walk the manufacturing partner through the steps of incorporating the iron into the sauce, finishing it, and packaging it.

- Ship the sauce to the US to undergo shelf-life testing.
- Once the sauce has passed shelf-life testing, the company would take over the process of applying for FDA approval, etc.
- Lead public relations and educational outreach to government ministries, health workers, and consumers.

Finding the right formula

The process of adding iron to a food product is complicated, because if it is added in the wrong formulation, it can change the taste and/or color of the product. Since these changes may make the product undesirable to consumers, it is necessary to test multiple formulations using different types of iron.

The most expensive version of iron is totally encapsulated, which means that it doesn't break down and therefore shouldn't cause problematic changes to the product. However, Fortify hopes that with appropriate testing it will be able to find a lower-cost combination of iron forms that still does not alter the product in undesirable ways.

Shelf-life testing

Before a product goes on the market, it must undergo shelf-life testing. In Fortify's research plan, this research would be done by university food science labs, commercial food testing companies, or possibly some combination of the two.

Fortify expects to do standard accelerated shelf-life testing, which shows, for example, that a product will still be safe to consume after sitting on a shelf for two years at high temperatures.

Measuring impact on IDA

A long-term study could follow women who consume tomato paste in a particular state or region, measuring their blood iron levels before and after the introduction of iron-fortified tomato paste in the region. Fortify expects there would be a noticeable improvement in iron levels within a few months, based on the expert opinions of hematologists consulted, because consuming small amounts of iron gradually builds up iron stores in the body.

*All GiveWell conversations are available at
<http://www.givewell.org/research/conversations>*